

Section 5

Urban Ponds Restoration

5.1 Overview

The urban ponds restoration portion of the SEPP was intended to “improve water quality and ecological integrity of urban ponds and wetlands through removal of pollution sources and restoration of aquatic habitat”, according to the 1999 SEPP workplan. The primary stated objectives of the plan were to:

1. Return the ponds to their historic uses (such as boating, fishing or swimming),
2. Promote public awareness, education and stewardship;
3. Reduce pollutant loading and nutrient inputs and improve water quality;
4. Maintain or enhance biological diversity; and
5. Provide improved recreational uses at each pond.

These objectives were addressed by setting certain specific goals which will be discussed in the following section.

5.2 Goals

The 1999 Workplan set forth multiple goals for this program, including:

- Hiring a coordinator for the project; and
- Completing restoration or protection projects with preference for projects at Crystal Lake and Dorrs Pond.

These tasks were largely completed, as discussed in the following section.

5.3 Benefits Achieved

A. Hire an Urban Pond Coordinator

Mr. Art Grindle was hired in 2000. Mr. Grindle, along with help and support from the Manchester Conservation Commission¹, implemented many projects to benefit the ponds, including water quality monitoring, and volunteer trash pickup. Reports were completed annually², distributed to

stakeholders, and posted on the City of Manchester webpage.

B. Implement restoration/protection projects at the ponds

Many structural and non-structural projects have been completed at these and other ponds throughout Manchester as a direct result of the SEPP project.



Crystal Lake, a popular public recreation spot in the City, is located in south east Manchester.

¹ Special acknowledgement to Jen Drociak, who volunteered a great deal of her own time, both as a Conservation Commissioner and as a private citizen, to further the work of Urban Ponds Restoration in Manchester. From 2000-2005, she supported and supervised Mr. Grindle. After his employment ended, she has continued many of the projects on her own time, including coordinating volunteer cleanups at the ponds, continuation of water quality monitoring and writing year-end reports detailing restoration work at the ponds.
² <http://www.manchesternh.gov/CityGov/DPW/EPD/SEPP/Pond/Publications.html>



The swale at Crystal Lake, installed in 2004, was still in good shape and operational when photographed here in 2006. (Photo Courtesy Manchester EPD)

Structural projects included:

- **Crystal Lake, Corning Road** – Installation of a baffle tank to settle sediment prior to entering the lake.
- **Crystal Lake, Beach Site** – Crushed stone and French drains (perforated pipe) were placed along the side of the beach access road and parking lot. The stone infiltration trench and swale extended to maximize treatment before the pond.
- **Crystal Lake, Bodwell Road and Parking Lot** – StormTreat™ system was incorporated to capture sediment and remove phosphorus and nitrogen entering Crystal Lake.
- **Dorrs Pond, Site A, Blevens Drive** – Installation of a buried baffle tank was under the access road to settle sediment prior to entering the pond.
- **Dorrs Pond, Site B, Belmont Street** – A baffle tank and infiltration gallery (underground perforated pipe with crushed stone bedding) was installed. Leaching manholes were also installed to serve as pre-treatment to settle sand out before reaching the infiltration gallery.
- **Dorrs Pond, Site D, Hooksett Road** – At the Dorrs Pond tributary outlet, across from Bonneville & Son car dealership on Hooksett Road, three baffle tanks were installed. The tanks remove sediment from three distinct discharges before flow enters the pond.
- **Nutts Pond, East Inlet** – A forebay was constructed to provide settling of sediment from stormwater entering Nutts Pond from the east near Henry's Collision Center. Restoration and enhancement of the wetland adjacent to this inlet was also completed.
- **Nutts Pond, South Inlet** – As for the east inlet, a sediment forebay was constructed and wetlands were restored.

A grant for \$60,000 was received from NHDES to supplement SEPP funding for the work at Nutts Pond South and East Inlets.



Construction of a forebay at Nutts Pond, December 2006. (Photo Courtesy Manchester EPD).

Summary of other activities:

- The Filip Glen property, 16 acres of open land and wetland adjacent to Crystal Lake and Mosquito Brook, was purchased using \$100,000 from the SEPP funds, \$40,000 from a private developer for environmental mitigation, and \$400,000 from the State of New Hampshire as mitigation for the

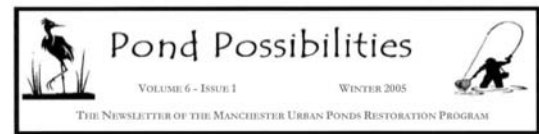
widening of I-93. The land will be maintained by the Crystal Lake Preservation Association;³

- The non-native invasive plant Common Reed (*phragmites australis*) was chemically removed or managed (via herbicide application) adjacent to the beach in other areas around the Crystal Lake;
- The non-native invasive plant Brazilian elodea (*Egaria densa*) was manually and chemically removed at Nutts Pond;
- Erosion control and runoff treatment (biologs, riprap channel protection and wetland plantings) were installed at Dorrs Pond and Crystal Lake tributaries;
- Catchbasin stenciling was implemented around each of the ponds in conjunction with the Education project (Section 7) and Stormwater Management project (Section 3);
- Watershed signs, i.e. "Now entering Dorrs Pond Watershed", were installed around Manchester's ponds for public education;



Dorrs Pond is located in Livingston Park, in the north-east corner of Manchester.

³ <http://www.rebuilding93.com/content/environmental/wetland/manchester/crystallake/>



INVASIVE PLANT TREATED AT CRYSTAL LAKE



Above and Below: Mike Morrison applies an herbicide treatment on an invasive *Phragmites* stand at Crystal Lake. Photos by Art Gendall.

For several years the non-native invasive plant, Common Reed (*Phragmites australis*), has been encroaching the Crystal Lake shoreline. *Phragmites* invades wetland and shoreline areas and displaces beneficial native plant species, such as Cattail, rushes, and sedges, and alters the natural biodiversity of the area. A native of Europe, *Phragmites* rapidly overtakes areas where it is introduced because it has no natural predators to keep the population "in check". As this happens, the impacts on recreation, as well as natural wildlife habitat, can become threatened.

On September 13th, Municipal Pest Management Services applied an herbicide treatment (Glyphosate, trade name *Rodeo*) on the infested areas of Crystal Lake. *Rodeo* is similar to the household herbicide *Roundup* and is comprised of a concentrated salt. *Rodeo* quickly breaks down to its raw constituents (carbon dioxide, nitrogen, phosphorus and water) as soon as it contacts water, making it safe for plant eradication in aquatic situations.

Even though the herbicide was only sprayed on *Phragmites* stems, a second treatment may be required next year. A 2005 permit application to the N.H. Department of Agriculture is being written. The Crystal Lake Preservation Association performed the same type of treatment around the lake in 1997. That treatment managed the infestation from spreading for about 5 years. A long-term treatment plan should be developed and implemented with the cooperation of the Crystal Lake Preservation Association, with the goal of complete *Phragmites* eradication.

The dead stalks will be cut and burned after ice in this winter. This will remove the seed stock from the site and the nutrient-rich decaying plant material from entering and polluting the lake water.



An area of *Phragmites* was also dredged near the parking lot drainage entrance into the Crystal Lake 1) Area of *Phragmites* in lake before dredging 2) During dredging 3) Dredging *Phragmites* pile after dredging 4) Area of Crystal Lake free of *Phragmites* after dredging. Photos by Manchester EPD.

Newsletters and fact sheets are available on the urban ponds website.

- A pond information website was created and is maintained at <http://www.ci.manchester.nh.us/UrbanPonds/>;
- Two "Earth and Pond Festivals" were held in Manchester, including guest speakers, informational booths, and live music;
- Informational kiosks were constructed at Dorrs Pond, Maxwell Pond, McQuesten Pond, and Nutts Pond. Existing kiosks at Crystal Lake and Pine Island Pond were repaired;
- A series of fact sheets and maps were prepared for each of the seven ponds, including facts about the history, exotic plants, common fish, bathymetry, and sampling stations at the ponds;

Year	Number of Cleanup Events	Event Hours	Number of Bags Collected	Estimated Poundage of Bags	# Participants ⁴	Est Value Volunteer Time	Sample of Items Removed from Ponds
2000	4	15	89	1,780	32	\$1,129	
2001	4	15	58	830	34	\$1,904	2 microwave ovens, tires, shopping carts
2002	7	19	56	1,120	15	\$1,122	
2003	11	24	136	2,720	32	\$2,029	Grill, propane tank, motorcycle, gun
2004	11	26.5	175	6,540	38	\$5,098	Aquarium, lawn mower, 41 tires
2005	9	18	74	1,410	33	\$2,571	Car fender, windshield & seat, stereo speaker
2006	7	8.5	52	1,040	29	\$2,760	Monster truck tire, baby carriage, 2 50-gallon drums
TOTALS:	53	126	640	15,440	30 (average)	\$16,613	

Table 5-1
Pond Cleanup Statistics

- An annual newsletter, "Pond Possibilities", was created and distributed via hard-copy and electronic mailing lists from 2000 to 2005.⁵
- Annual or semi-annual pond cleanups were held at each of the seven ponds from 2000 to 2006 (Table 5-1);
- Biological and chemical water quality monitoring was conducted at each of the seven ponds and their tributaries from 2000 to 2006;
- Pine Island Pond Environmental Society (PIPES) was formed in 2004 to foster and protect Pine Island Pond.

⁴ The number of different individuals, counted only once per year, taking part in any pond cleanup event. The average number of different people participating in any given year was 30. Details on values in this table can be found in the individual annual reports.

⁵ Newsletters, fact sheets, and other publications of the Urban Ponds Restoration Program are available at <http://www.manchesternh.gov/CityGov/DPW/EPD/SEPP/Pond/Publications.html>

5.4 Measurable Results and Long Term Benefits

Certain measurable results were established at the onset of the project through the workplan. Some of the measures, such as percent increase in species of birds, macroinvertebrates, and/or fish observed, were found to be not practicable to track. The Urban Ponds Restoration Program focused on implementation of improvements, rather than on monitoring biological species, and as a result, species were not tracked.

Other measures tracked during the course of the project, such as pond cleanup statistics, and are detailed below and in Table 5-1.

- Tons of litter removed from the ponds during volunteer clean up days: 7.7 tons (15,400 pounds). Note that this is an estimate of the weight of bagged trash only, and do not include tires or other large pieces of unbaggage trash.
- Number of persons volunteering on trash removal days: 30 different individuals participated in a pond clean up day annually on average.

- Number of pond cleanup events: 53 over the period from 2000 to 2006.
- Acres preserved at Filip Glen adjacent to Crystal Pond and Mosquito Brook: 16 acres.
- Number of visits to the Urban Pond Restoration Website: 46,168 (through October 2006).⁶
- Number of “hard copy” Manchester Urban Ponds Restoration Project (UPRP) publications distributed, including newsletters, brochures and fact sheets: 4,020 (as of the end of 2004 – most recent data available). See figure next page.
- Volunteer time for water quality sampling events at the ponds from 2000 to 2006 (approximately 81 volunteer hours): \$1,400.
- NHDES Limnology Laboratory analysis of water quality samples: \$2,650.
- NHDES grant for Nutts Pond Watershed Improvement Projects, including work at the east and south inlets, \$60,000.
- Grant from Sam’s Club/Walmart to construct a boardwalk at McQuesten Pond: \$4,000.

Total leveraged funds: \$99,150

In addition to the physical benefit of removing and properly disposing of trash, benefits of the pond project include education for volunteers and the public which may translate into increased concern and stewardship towards the ponds.⁷

Funds used to purchase the Filip Glen property are not included as leveraged funds, as they would still have come to the City as mitigation in the absence of the SEPP.

5.5 Leveraged Funding

Leveraged funding for the Restoration of Urban Ponds project included:

- Incidentals for Mr. Grindle, office space, phone, computer and supplies (Manchester Planning Department): Amount not available.
- Volunteer time during pond cleanup events: \$16,600 approximately (Table 5-1).
- Volunteer time for Jen Drociak, from 1999 to 2006, total of 580 hours⁸, estimate at \$14,500.

⁶ Individual visitors are counted once each time they come to the website and are counted only once per visit no matter how many pages they view.

⁷ NH National Public Radio story on this program:
<http://www.nhpr.org/node/6189>

⁸ Personal communication and spreadsheet, Jen Drociak, 1 November 2006. Does not include time spent



Maxwell Pond is a man-made impoundment near the downstream end of Black Brook.

volunteering with the Conservation Commission or as a volunteer during pond cleanup events.